Space Weather Forecast

Issued on Saturday, 05 August 2023 at 13:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: G1-G2 Minor/Moderate storm likely at times from Coronal Mass Ejection arrivals. R1-R2 Radio blackouts possible. S1/Minor Radiation Storm easing.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Two Moderate flares were observed. The largest was from an old sunspot over the west limb peaking 05/0936 UTC. The second was a long duration event at 05/0719 UTC from the region in the northwest. This the most notable and largest region, as a compact pair of opposite polarity spots, with surrounding smaller spots leading to some increased complexity. There are eight sunspots on the disc, but these are otherwise small and simple, and generally either stable or weakening. The long duration flare produced a CME (coronal mass ejection) that is still undergoing analysis, but is unlikely to have a significant Earth-directed component given its location.

Solar Wind / Geomagnetic Activity: A CME was observed arriving at 05/0209 UTC, likely the early arrival of one that was anticipated to arrive on 06 Aug. This showed a small increase in wind speeds from background levels of 380km/s to 450km/s, before easing again. The total interplanetary magnetic field strength was Moderate to Strong, due to a previous CME arrival on 04 Aug, but then increased to be persistently Strong between 05/0220-0800 UTC in response to the new CME arrival. These then eased to be Moderate at the end of the period. The north-south component was generally southward (negative) and strongly southward at times. Brief positive (northward) orientated periods were observed. Geomagnetic activity was Unsettled to Active, but G1-G2 Minor/Moderate Storm 05/0000-0900 UTC due the CME arrival.

Energetic Particles / Solar Radiation: The observed count rate of energetic particles (high energy protons) rose in response to the long duration Moderate flare, reaching the S1/Minor Storm threshold by 05/1115 UTC.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is likely to be Low to Moderate, with a chance of isolated Moderate flares, mainly from the region in the northwest. This risk decreases day 3 and 4 (07 and 08 Aug) as this region rotates off the visible disc.

Solar Wind / Geomagnetic Activity: Further CME influence is possible day 1 from ongoing CME arrival. Next CME enhancement is likely to be day 3 or day 4 (07 or 08 Aug) from the M2.0 flare and filament lift on 04 Aug, although this is low confidence and analysis continues on this complex eruption. Overall geomagnetic activity is likely to ease from its initially disturbed conditions to be mainly Quiet, with isolated Unsettled spells day 2 (06 Aug). However further CME arrivals, will increase this again to Active to G2 Moderate Storms for periods on day 3 or day 4 (07-08 Aug).

Energetic Particles / Solar Radiation: The count rate of energetic particles is likely to gradually ease from currently Minor Radiation storm levels, back towards background. There is a slight chance of further enhancements from any large flares that occur from the region in the

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

northwest.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	70	20	60	40
Strong	G3	No	1	1	10	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	50	30	30
Very Active	R3 to R5 X	No	5	5	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	100	20	10	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.